

What is claimed is:

1. A copper-based alloy casting comprising:  
69 to 88% of Cu;  
2 to 5% of Si;  
0.0005 to 0.04% of Zr;  
0.01 to 0.25% of P by mass; and  
a remainder including Zn and inevitable impurities, and  
satisfying  $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} \leq 71$ ,  
wherein mean grain size after melt-solidification is  
100  $\mu\text{m}$  or less, and  $\alpha$ ,  $\kappa$  and  $\gamma$ -phases occupy more than 80% of  
phase structure.

2. A copper-based alloy casting comprising:  
69 to 88% of Cu;  
2 to 5% of Si;  
0.0005 to 0.04% of Zr;  
0.01 to 0.25% of P by mass;  
at least one element selected from a group consisting  
of 0.001 to 0.2% of Mg, 0.003 to 0.1% of B, 0.0002 to 0.01%  
of C, 0.001 to 0.2% of Ti and 0.01 to 0.3% of rare earth  
element; and  
a remainder including Zn and inevitable impurities, and  
satisfying  $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} - 0.5 \times [\text{i}] + 0.5$   
 $\times [\text{ii}] \leq 71$ , [i] being a group consisting of Mg and B, and

[ii] being a group consisting of C, Ti and rare earth element,

wherein mean grain size after melt-solidification is 100  $\mu\text{m}$  or less, and  $\alpha$ ,  $\kappa$  and  $\gamma$ -phases occupy more than 80% of phase structure..

3. A copper-based alloy casting comprising:

69 to 88% of Cu;

2 to 5% of Si;

0.0005 to 0.04% of Zr;

0.01 to 0.25% of P by mass;

at least one element selected from a group consisting of 0.02 to 1.5% of Al, 0.2 to 4.0% of Mn and 0.01 to 0.2% of Cr, and

a remainder including Zn and inevitable impurities, and satisfying  $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} - 1.8 \times \text{Al} + a \times \text{Mn} + 0.5\text{Cr} \leq 71$  ( $a = 2$  in a case that Mn is contained more than 0.5% and satisfies  $0.2 \times \text{Si} \leq \text{Mn} \leq 2.0 \times \text{Si}$ , and  $a = 0.5$  in the other cases),

wherein mean grain size after melt-solidification is 100  $\mu\text{m}$  or less, and  $\alpha$ ,  $\kappa$  and  $\gamma$ -phases occupy more than 80% of phase structure.

4. A copper-based alloy casting comprising:

69 to 88% of Cu;

2 to 5% of Si;

0.0005 to 0.04% of Zr;

0.01 to 0.25% of P by mass;

at least one element selected from a group consisting of 0.001 to 0.2% of Mg, 0.003 to 0.1% of B, 0.0002 to 0.01% of C, 0.001 to 0.2% of Ti and 0.01 to 0.3% of rare earth element;

at least one element selected from a group consisting of 0.02 to 1.5% of Al, 0.2 to 4.0% of Mn and 0.01 to 0.2% of Cr; and

a remainder including Zn and inevitable impurities, and satisfying  $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} - 0.5 \times [\text{i}] + 0.5 \times [\text{ii}] - 1.8 \times \text{Al} + a \times \text{Mn} + 0.5\text{Cr} \leq 71$  ( $a = 2$  in a case that Mn is contained more than 0.5% and satisfies  $0.2 \times \text{Si} \leq \text{Mn} \leq 2.0 \times \text{Si}$ , and  $a = 0.5$  in the other cases),

wherein mean grain size after melt-solidification is 100  $\mu\text{m}$  or less, and  $\alpha$ ,  $\kappa$  and  $\gamma$ -phases occupy more than 80% of phase structure.

5. The copper-based alloy casting according to any one of claims 1 to 4, further comprising:

at least one element selected from a group consisting of 0.1 to 2.5% of Sn, 0.02 to 0.25% of Sb and 0.02 to 0.25% of As by mass.

6. The copper-based alloy casting according to any one of claims 1 to 5, further comprising:

at least one element selected from a group consisting of 0.004 to 0.45% of Pb, 0.004 to 0.45% of Bi, 0.03 to 0.45% of Se and 0.01 to 0.45% of Te by mass.

7. The copper-based alloy casting according to any one of claims 1 to 6,

wherein P/Zr is in the range of 0.8 to 250, Si/Zr is in the range of 80 to 6000, and Si/P is in the range of 12 to 220 in percent by mass.

8. The copper-based alloy casting according to any one of claims 1 to 7,

wherein dendrites are crystallized, and the dendrite have shapes with no arms.

9. The copper-based alloy casting according to any one of claims 1 to 7,

wherein Fe and/or Ni contained as impurities are/is contained 0.5% or less by mass.

10. The copper-based alloy casting according to any one of claims 1 to 7,

wherein Zr is in the range of 0.0010 to 0.0095%.